ABSTRACT

Methods and apparatus for real-time dynamic analysis of a chemical etching process are provided. The apparatus comprises an optical element (36) operative to pass a beam of electromagnetic radiation at least at two points in time through a liquid phase (42) comprising at least one chemical component and including an etchant, wherein the etchant is operative to etch a solid. A detector (60) is operative to perform an ex-situ non-contact scanning detection of the electromagnetic radiation subsequent to passing through the liquid phase in a near infra-red range (700-2500 nm) at the at least at two points in time so as to detect a change in an optical property of at least one of the at least one chemical component and the etchant. The apparatus further comprises a processor (64) operative to activate an algorithm so as to compare the change in the optical property of the at least of the at least one chemical component and the etchant received from the detector so as to provide data concerning a change in concentration of the etchant; and further configured to perform a chemometric manipulation of the data so as to provide a rate of etching of the solid.